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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/577,221

05/23/2000

Michael A. Rolenz

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07/24/2008

THE AEROSPACE CORPORATION
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EXAMINER

BELLO, AGUSTIN

ART UNIT

PAPER NUMBER

2613

MAIL DATE

DELIVERY MODE

07/24/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary**Application No.**

09/577,221

Applicant(s)

ROLENZ, MICHAEL A.

Examiner

Agustin Bello

Art Unit

2613

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 April 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8, 11-14 and 16-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 5-8, 11-14 and 16 is/are rejected.
- 7) ☒ Claim(s) 2-4 and 17-23 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/C)
- Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4/14/08 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 8, 11-14, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beauducel (Patent No. US 5,465,270 A) in view of Palmer (Patent No. US 6,141,132 A).

Regarding claims 1 and 11, Beauducel teaches a sigma delta modulator (reference numeral 4 in Figure 2) for receiving the analog input signal and modulating the analog signal into a modulated symbol signal, a transmitter (reference numeral 7 in Figure 2) for converting the modulated symbol signal into a modulated binary signal, and for transmitting the modulated binary laser signal over the optical communication medium, the modulated binary laser signal having a pulse width having a duration representative of the analog input signal (inherent in modulation of an optical signal), a receiver (reference numeral 8 in Figure 2) for receiving and detecting the pulse width of modulated binary laser signal for providing a received symbol

signal, and a digital filter (reference numeral 10 in Figure 2) for filtering the symbol signal into the digital output signal. Beauducel differs from the claimed invention in that Beauducel fails to specifically teach that the modulated binary output is a laser signal. However, Beauducel suggests as much via disclosure of the possibility of other types of transmitters (column 3 lines 60-62). Furthermore, Palmer teaches that the use of laser transmitter in conjunction with a sigma-delta modulator is well known in the art (reference numeral 34, 36 in Figure 1). One skilled in the art would have been motivated to employ a laser as taught by Palmer as the transmitter in Beauducel since lasers are known to provide an advantage over other light sources in terms of coherence length, spatial power distribution, spectral density. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to employ a laser as taught by Palmer as the transmitter in Beauducel.

Regarding claims 8 and 16, Beauducel teaches that the optical communication medium is selected from the group consisting of free-space and a fiber optic (see Beauducel's claim 15).

Regarding claims 12 and 13, the combination of references and Beauducel in particular teaches that the modulated digital laser signal is communicated over the optical communication medium without the use of frame words (i.e. without the prefix Px or suffix Sx shown in Figure 1 and instead with an embedded clock produced by coding circuit 6 in Figure 2).

Regarding claim 14, the combination of references and Beauducel in particular teaches that the modulated digital laser signal is a pulse having a pulse width indicating the analog input signal (inherent in modulation of an optical signal) and the pulse is a laser pulse communicated over the optical communication medium (see Beauducel's claim 15).

4. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Beauducel in view of Palmer, as applied to claim 1 above, and further in view of Scott (Patent No. US 6,385,235 B1).
5. Regarding claim 5, the combination of Beauducel and Palmer differs from the claimed invention in that it fails to specifically teach a timing recovery loop for generating a timing signal from the receive symbol signal for clocking the digital filter. However, Scott teaches that timing recovery loops (reference numeral 707 in Figure 7) that produce clocking signals are well known in the art. One skilled in the art would have been motivated to employ a timing recovery loop in the combination of Beauducel and Palmer in order to minimize the effects of any timing jitter during transmission (column 5 lines 7-12). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to include a timing recovery loop in the combination of Beauducel and Palmer for generating timing signal from the received signal symbol for clocking the digital filter of Beauducel.
6. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beauducel in view of Palmer, as applied to claim 1 above, and further in view of applicant's admitted prior art (AAPA).

Regarding claims 6 and 7, the combination of Beauducel and Palmer differs from the claimed invention in that it fails to specifically teach that the sigma-delta modulator is either a first-order sigma-delta modulator or a second-order sigma-delta modulator. However, as noted by applicant, both of these types of sigma-delta modulators are well known in the art. One skilled in the art would have been motivated to employ either of these types of sigma-delta modulators in the combination of Beauducel and Palmer as a matter of design choice or as a

matter of desired cost to error ratio. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to employ either a first-order or second-order sigma-delta modulator in the combination of Beauducel and Palmer.

Allowable Subject Matter

7. Claims 2-4, 17-23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

8. Applicant's arguments filed 4/14/08 have been fully considered but they are not persuasive. Applicant argues that the characteristic that distinguishes the claimed invention from that of the cited prior art is the fact that the claimed invention depends on pulse width rather than any clocking signals. However, this does not detract from the fact that all of the structural limitations of the claimed invention are met by the cited prior art. For example, the combination of Beauducel and Palmer teaches a sigma-delta modulator, a transmitter, a receiver, and a digital filter. Instead of reciting any distinguishing structural characteristics of the sigma-delta modulator, the transmitter, the receiver, or the digital filter in claim 1 or claim 11, applicant merely recites what these elements are used for or how they perform. As such, the examiner notes that a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In the instant application, the examiner is taking the

position that the combination of Beauducel and Palmer, having met all of the structural limitations of the claimed invention are capable of performing as claimed.

The examiner also disagrees with applicant's point that Beauducel fails to specifically teach that the modulated optical signal has a pulse width that has a duration representative of the analog input signal. As with any modulated optical signal the duration of the pulse width will in some way be representative of the analog input signal. Even if the pulse width duration is never varied or is set to a standard width, it can be broadly said that that standard pulse width duration is representative of the analog input signal. The point being made here is that the claim language is overly broad in reciting that the pulse width duration merely represents the analog input signal. If applicant is convinced that the distinguishing characteristic between the claimed invention and the cited prior art is the fact that claimed invention relies on pulse width modulation, then more specific limitations that reflect that should be positively recited in the claim. Simply relying on the recitation of structural elements and how they function is not enough in itself to convey the patentable subject matter applicant advocates. Likewise, relying on overly broad terminology such as "...having a duration representative..." fails to sufficiently convey the import of pulse width modulation to the patentably of the claimed invention.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Agustin Bello whose telephone number is (571) 272-3026. The examiner can normally be reached on M-F 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571)272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Agustin Bello/
Primary Examiner, Art Unit 2613